

***Remarks***

Reconsideration of this Application is respectfully requested. Upon entry of the foregoing amendments, claims 1-44 are pending in this application, with claims 1, 6, 9, 14 and 20 being the independent claims. Claims 17 and 37 are amended. These changes are believed to introduce no new matter, and their entry is respectfully requested.

In the Final Office Action dated November 10, 2004, the Information Disclosure Statement filed previously in this application is objected to. Claim 37 is objected to. Claims 17-19 stand rejected under 35 U.S.C. § 112, second paragraph, due to an antecedent basis problem. Claims 1, 20-26, 27-32, 33-39 and 40-44 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Bortnikov *et al.*, U.S. Patent No. 6,029,004 in view of Goebel, U.S. Patent No. 6,139,200. Claims 2 and 10 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Bortnikov in view of Goebel and in further view of Chaitin *et al.*, U.S. Patent No. 4,656,582. Claims 3-5, 7-8, 11-13, and 16-19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Bortnikov *et al.* in view of Goebel and in further view of Sabot *et al.*, U.S. Patent No. 5,347,654.

***Telephone Interview with the Examiner at the USPTO on February 7, 2005***

Applicants' representative thanks the Examiner for the courtesies extended during the telephone interview of February 7, 2005. David L. Stephenson, one of the inventors, also participated in the discussion. The differences between the cited references, primarily Bortnikov *et al.*, and the pending claims, were discussed. The Examiner requested that the arguments be submitted in writing.

***Claim amendments***

Claims 17 and 37 are amended to correct minor informalities, as suggested by the Examiner. No new search and/or consideration is believed to be required.

***Rejections under § 103(a) based on Bortnikov***

As discussed during the telephone interview with the Examiner on February 7, 2005, Applicants respectfully submit that the rejections based on Bortnikov are based on an incorrect interpretation of the disclosure of Bortnikov.

Specifically, all the independent claims recite an “intermediate representation.” This term has a specific meaning to a compiler writer. Generally, this is a language that is intermediate in complexity between a high level programming language (such as C++ or Java) and machine code. The intermediate representation contains similar information to the source code, but is in a form that is “more friendly” to the compiler. For the Examiner’s convenience, Applicants attach pages xxiii, 2, 4 and 67-69 from a textbook by Stephen S. Muchnick, *Advanced Compiler Design And Implementation*, Morgan Kaufmann Publishers, Inc. (1997), which further elaborates on the concept of intermediate representations.

Bortnikov, on the other hand, deals with “call graphs” that have profile frequencies. A “call graph,” in Bortnikov, is an entirely different construct from an intermediate representation. A call graph, according to Bortnikov (see col. 5, lines 10-18), “is a graph consisting of one note for each procedure in the program portion of interest.” A call graph is not an intermediate representation, is not regarded as an intermediate representation by compiler writers, and contains much less information than a complete intermediate representation. Accordingly, Applicants respectfully submit

that at least based on this difference between the claim language and Bortnikov, the rejections based on Bortnikov are in error.

Additionally, step (3) of claim 1 recites “updating said frequency data to maintain accuracy of said frequency data during compilation.” This is completely different from Bortnikov. Bortnikov, see col. 5, lines 18-21, updates the call graph as follows: “A call graph can be 'weighted' with estimates of execution frequencies.” It is important to note that Bortnikov does not update the frequencies. Rather, it is the call graph in Bortnikov that is updated, even though the values of the frequencies do not change. This is different from the language of step (3) of claim 1, where the frequencies are updated “to maintain accuracy of said frequency data.”

Further, the call graph annotations in Bortnikov and the algorithm described in Bortnikov do not care about how profiling data is generated. See, *e.g.*, col. 6, lines 1-6 of Bortnikov. In other words, Bortnikov doesn't care whether the frequencies are exact or inexact. In the present application, the goal of the algorithm is to maintain and improve accuracy. Bortnikov ignores the distinction between exact and inexact frequencies for purposes of his algorithm.

Thus, Applicants respectfully submit that due to the numerous distinctions between Bortnikov and the pending claims, the rejections are based on an incorrect understanding of Bortnikov. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejections.

***References submitted with an IDS***

For the Examiner's convenience, Applicants resubmit the twenty-four references that were previously submitted with an IDS.

Stephenson *et al.*  
Appl. No. 09/560,555  
Attorney Docket No. 15-4-910.00

***Conclusion***

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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